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EXAMINER	
ZERVIGON, RUDY	
ART UNIT	**PAPER NUMBER**
1763	

DATE MAILED: 05/06/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

15 llm

Office Action Summary	Application No.	Applicant(s)
	09/379,753	GRIMBERGEN, MICHAEL N.
	Examiner	**Art Unit**
	Rudy Zervigon	1763

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *24 January 2005*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-4,6-14,23-25,28-30,33-36,38-42,44-51 and 57-63* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-4,6-14,23-25,28-30,33-36,38-42,44-51 and 57-63* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1)☐ Notice of References Cited (PTO-892)

2)☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3)☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.

4)☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .

5)☐ Notice of Informal Patent Application (PTO-152)

6)☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC 103

1. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

2. Claims 1-4, 11-14, 30, 33-35, 38, 39, and 61-63 are rejected under 35 U.S.C. 103(a) as being unpatentable over Giapis et al (USPat. 5,002,631) in view of Piwonka-Corle (USPat. 5,608,526). Giapis teaches a substrate etching apparatus (Figure 1; col. 3, lines 9-21) comprising a chamber (100) including:

i. A substrate support (110) to support a substrate (120)

ii. A gas distributor (102) to introduce an etchant gas into the chamber

iii. A gas energizer (140; column 3, lines 61-68) to energize the etchant gas

iv. A gas exhaust (103) to exhaust gas from the chamber

Giapis further teaches non-plasma radiation laser sources (161, 162), one of which (161) emerges from the chamber. Giapis further teaches one or more detectors (164, 165) to detect an intensity of a first radiation/light originating from the radiation/light source(s) (column 4; lines 18-22) and reflected from a substrate (120; "workpiece" column 4; lines 18-22) or a chamber wall and generate sample signals (column 4, lines 40-49, 18-30). Inclusive, Giapis teaches:

i. A sample detector / first reference detector (164) to detect a first reference radiation from the plasma and generate a first reference signal ("systems…based on measurements" - column 4, lines 18-30). Applicant's additional requirement of "wherein the first reference radiation comprises a background radiation" is an intended use requirement. Further, it has been held that claim language that simply specifies an intended use or field of use for the invention

generally will not limit the scope of a claim (Walter , 618 F.2d at 769, 205 USPQ at 409; MPEP 2106). Additionally, in apparatus claims, intended use must result in a structural difference between the claimed invention and the prior art in order to patentably distinguish the claimed invention from the prior art. If the prior art structure is capable of performing the intended use, then it meets the claim (In re Casey,152 USPQ 235 (CCPA 1967); In re Otto , 136 USPQ 458, 459 (CCPA 1963); MPEP2111.02). Further,

ii. A reference detector / second reference detector (165) to detect a second reference radiation/light (161) from the radiation/light source (161) and generate a reference signal ("systems...based on measurements" - column 4, lines 18-30).

Giapis further teaches the detection (163) of an intensity of a second radiation (162) emitted from the radiation source and generate a reference signal (column 4, lines 40-49) at the second detector (163). Giapis further teaches the uniformity of wavelength between the first radiation reflected from the substrate and the second radiation (from the source 162) as per the "bifurcated fiber bundle 166" detected by one monochrometer detector 163. The depth an uniformity of Giapis' etch are monitored by laser scattered by the wafer (column 5, lines 20-23).

Giapis further teaches one (originating from laser 162; Figure 1) or more first fibers that transmit radiation from the radiation source (laser 162) to the reference detector (163) "substantially without transmitting the reference radiation to the chamber" – see Giapis (Figure 1 – no radiation beam entering Giapis' chamber from laser 162: column 4; lines 40-50). Here, Giapis is specific in teaching that his fiber bundle 166 which feeds data to his detector 163, is divided into two branches. One branch is coupled to the radiation source (162) as shown in Figure 1 such that

radiation from the radiation source (laser 162) travels to the reference detector (163) "substantially without transmitting the reference radiation to the chamber".

Giapis does not teach:

i. a signal analyzer adapted to normalize the sample signal relative to the reference signal by mathematically operating on the sample signal with the reference signal to generate a normalized signal, and determine a thickness of a layer being etched on the substrate or chamber wall from the normalized signal

Piwonka-Corle teaches an ellipsometry apparatus (Figure 12) for substrate analysis (column 3, lines 9-20). Specifically, Piwonka-Corle teaches:

ii. a signal analyzer (100; column 15, lines 9-23; Figure 12) adapted to normalize the sample signal (9) relative to the reference signal ("reference beam") by mathematically operating on the sample signal with the reference signal to generate a normalized signal ("is programmed to normalize"), and determine a thickness of a layer on a substrate from the normalized signal It is inherent that Piwonka-Corle's signal analyzer normalization apparatus compensates for fluctuations in reflected radiation and background radiation. Specifically, Piwonka-Corle teaches that the signal analyzer (100; column 15, lines 9-23; Figure 12) is programmed to normalize (column 15, line 15) specifically for "intensity fluctuation" compensations (column 15, line 18). Inclusive, that Piwonka-Corle teaches background radiation compensation during signal processing is supported by Piwonka-Corle's very teaching of polychromatic collection and monochromatic analysis of said specific sample radiation signal, i.e. wavelength (column 11, line 60 – column 12, line 8).

Applicant's claim 61 claim limitations of:

"

(a) before the gas energizer energizes the etchant gas, measuring the sample and reference signals,

(b) after the gas energizer energizes the etchant gas but before substantially etching has occurred, measuring the sample signal, and

(c) during etching, measuring the sample and reference signals, whereby a thickness of a layer being etched on the substrate or chamber wall" are requirements of intended use of the claimed apparatus claims. Further, it has been held that claim language that simply specifies an intended use or field of use for the invention generally will not limit the scope of a claim (Walter , 618 F.2d at 769, 205 USPQ at 409; MPEP 2106). Additionally, in apparatus claims, intended use must result in a structural difference between the claimed invention and the prior art in order to patentably distinguish the claimed invention from the prior art. If the prior art structure is capable of performing the intended use, then it meets the claim (In re Casey,152 USPQ 235 (CCPA 1967); In re Otto , 136 USPQ 458, 459 (CCPA 1963); MPEP2111.02).

Applicant's claim 62 claim limitations of "the background radiation comprises...", and the entirety of claim 63 are requirements of intended use of the claimed apparatus claims. See above.

It would have been obvious to one of ordinary skill in the art at the time the invention was made for Giapis to use Piwonka-Corle's signal analyzer to determine a thickness of a layer on a substrate from the normalized signal

Motivation for Giapis to use Piwonka-Corle's signal analyzer to determine a thickness of a layer on a substrate from the normalized signal is to determine film thicknesses more accurately (column 15, lines 10-15).

3. Claims 6-10, 23-25, 28, and 29 are rejected under 35 U.S.C. 103(a) as being unpatentable over Giapis et al (USPat. 5,002,631) and Piwonka-Corle (USPat. 5,608,526), in view of Cates et al (USPat. 5,328,517). Giapis and Piwonka-Corle are discussed above. Giapis and Piwonka-Corle do not teach a signal analyzer that performs the normalization by assigning a specific mathematical algorithm for the normalization.

Specifically, Giapis and Piwonka-Corle do not teach a signal analyzer adapted to normalize the sample signal relative to the reference signal by mathematically operating on the sample signal with the reference signal to generate a normalized signal, and determine a thickness of a layer being etched on the substrate or chamber wall from the normalized signal and thereby compensate for both fluctuation in the reflected light that originates from the light source, and compensate for background light from the plasma, by receiving the sample signal and the reference signal and determining a corrected sample signal by a specific mathematical algorithm.

Cates teaches an apparatus for removing material from a substrate (column 3, lines 21-44). Cates further teaches a similar photodetecting system and associated components (column 3, lines 44-65). Specifically, Cates teaches:

i. a signal analyzer (148; column 15, line 44 - column 16, lines 10) adapted to normalize the sample signal ("signals received in each data channel") relative to the reference signal (18'; Figure 8; column 15, lines 60-68) by mathematically operating (column 18) on the sample signal with the reference signal to generate a normalized signal (column 16, lines 5-10) by receiving the sample signal ("signals received in each data channel") and the reference signal (18'; Figure 8; column 15, lines 60-68) and determining a corrected sample signal ("normalized signal"; column 16, lines 5-10) by a specific mathematical

algorithm (column 18). Applicant's claim requirement of "and thereby compensate for both fluctuation in the reflected light that originates from the light source, and compensate for background light from the plasma" is, as a result of Cates' recited apparatus teachings above, an intended use claim requirement of the pending apparatus claims. Further, When the structure recited in the references is substantially identical to that of the claims, claimed properties or functions are presumed to be inherent. Where the claimed and prior art products are identical or substantially identical in structure or composition, or are produced by identical or substantially identical processes, a prima facie case of either anticipation or obviousness has been established. In re Best, 562 F.2d 1252, 1255, 195 USPQ 430, 433 (CCPA1977).

ii. a signal analyzer that performs the normalization by assigning a specific mathematical algorithm for the normalization (column 18, lines 30-45)

It would have been obvious to one of ordinary skill in the art at the time the invention was made for Giapis and Piwonka-Corle to reprogram Piwonka-Corle's signal analyzer in the manner of Cates' signal analyzer that performs the normalization by assigning a specific mathematical algorithm for the normalization.

Motivation for Giapis and Piwonka-Corle to reprogram Piwonka-Corle's signal analyzer in the manner of Cates' signal analyzer that performs the normalization by assigning a specific mathematical algorithm for the normalization is to generate Cate's weighted sum average (column 18, lines 24-43).

4. Claim 36 is rejected under 35 U.S.C. 103(a) as being unpatentable over Giapis et al (USPat. 5,002,631) and Piwonka-Corle (USPat. 5,608,526), in view of Taketora Saka

(JP01260304). Giapis and Piwonka-Corle are discussed above. However, Giapis and Piwonka-Corle do not teach a lens to focus the reference radiation from the radiation source onto the first fibers. Taketora Saka shows a lens (6) in Taketora Saka's Figure focusing radiation between the reference radiation (3) and the substrate (1).

It would have been obvious to one of ordinary skill in the art at the time the invention was made for Giapis and Piwonka-Corle to use Taketora Saka's lens to focus the reference radiation from the radiation source onto the first fibers.

Motivation for Giapis and Piwonka-Corle to use Taketora Saka's lens to focus the reference radiation from the radiation source onto the first fibers is drawn to the level of ordinary skill in the art whereby lens optics are known to focus, i.e. concentrate, light rays thereby increasing the radiations intensity to a small area.

5. Claims 40-42, 44-51, and 57-59 are rejected under 35 U.S.C. 103(a) as being anticipated by Giapis et al (USPat. 5,002,631) in view of Ish-Shalom (USPat. 6,299,346) and Moslehi (USPat. 5,156,461). Giapis is discussed above. However, Giapis does not teach a feedback controller adapted to regulate a power level of the radiation source in relation to the detected intensity of the second radiation. Ish-Shalom teaches fiber optic (24, Fig.2a) spectroscopy of a wafer (10). Ish-Shalom additionally teaches a chamber (14) comprising an electro-optical shutter (23) modulated (column 10, lines 40-45) radiation source (28), first (32) and second (34) detectors for detecting an intensity of a first radiation reflected (column 9, lines 20-39) from a substrate and the detection of an intensity of a second radiation from the radiation source.

Ish-Shalom does not teach a controller (36) having feedback capacity adapted to regulate a power level of the reference radiation (28).

Moslehi teaches a controller (126; Figure 15) having feedback capacity (136, 132; Figure 15) adapted to regulate a power level of a reference radiation (134; Figure 15; column 6, lines 16-37).

It would have been obvious to one of ordinary skill in the art at the time the invention was made for Giapis to use Ish-Shalom's components and Moslehi's feedback controller adapted to regulate a power level of a reference radiation.

Motivation for Giapis to use Ish-Shalom's components and Moslehi's feedback controller adapted to regulate a power level of a reference radiation is to allow correction for electronic drifts as taught by Giapis (column 11, lines 1-18) and for wafer attribute control as taught by Moslehi (column 6; lines 57-65).

6. Claim 60 is rejected under 35 U.S.C. 103(a) as being anticipated by Giapis et al (USPat. 5,002,631), Ish-Shalom et al (USPat. 6,299,346), and Moslehi (USPat. 5,156,461) in view of Piwonka-Corle (USPat. 5,608,526). Giapis, Ish-Shalom, and Moslehi are discussed above. However, Giapis, Ish-Shalom, and Moslehi do not teach

iii. a signal analyzer adapted to normalize the sample signal relative to the reference signal by mathematically operating on the sample signal with the reference signal to generate a normalized signal, and determine a thickness of a layer being etched on the substrate or chamber wall from the normalized signal

Piwonka-Corle teaches an ellipsometry apparatus (Figure 12) for substrate analysis (column 3, lines 9-20). Specifically, Cates teaches:

iv. a signal analyzer (100; column 15, lines 9-23) adapted to normalize the sample signal (9) relative to the reference signal ("reference beam") by mathematically operating on the

sample signal with the reference signal to generate a normalized signal ("is programmed to normalize"), and determine a thickness of a layer on a substrate from the normalized signal

It would have been obvious to one of ordinary skill in the art at the time the invention was made for Giapis, Ish-Shalom, and Moslehi to use Piwonka-Corle's signal analyzer to determine a thickness of a layer on a substrate from the normalized signal

Motivation for Giapis, Ish-Shalom, and Moslehi to use Piwonka-Corle's signal analyzer to determine a thickness of a layer on a substrate from the normalized signal is to determine film thicknesses more accurately (column 15, lines 10-15).

Response to Arguments

7. Applicant's arguments filed January 24, 2005 have been fully considered but they are not persuasive.

8. Applicant's line of argument on page 15/29:

"

Thus, Piwonka-Corle discloses normalizing a signal to compensate for lamp intensity fluctuations or air currents. Piwonka-Coyle does not teach or suggest mathematically operating on a sample signal to compensate for background radiation that is from the plasma, as lamp intensity fluctuations from a lamp used to generate the sample beam and air currents are not background radiation from a plasma.

"

In respose, one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. In re Keller, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); In re Merck & Co., Inc., 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986).

Specifically, the Examiner notes that although Piwonka-Coyle does not specifically discuss applying his optical processor and accompanying components to receiving optical signals from plasma processing as taught by Giapis, it is noted that both references each share common wafer processing concerns including real-time optical monitoring of the wafers to achieve processing uniformity:

Giapis:

"

Increasingly sophisticated techniques have been proposed for optically inspecting etched workpieces and even optically monitoring the workpieces during the etching process.

"

(Giapis: column 1; lines 57-64)

"

Optical monitoring and control systems in the forms of one or more optical light sources 161, 162 and one or more optical receivers 163, 164 and 165 can be mounted outside the vessel window in order to optically monitor the workpiece during processing.

"

(Giapis: column 3; lines 4-8)

"

Typical optical monitoring systems comprise one or more optical sources 161 and 162 for directing optical energy onto the workpiece 120 and one or more optical detectors 163, 164 and 165 for receiving light <u>from the workpiece or plasma</u>.

"

(Giapis: column 4; lines 18-22)

Piwonka-Coyle:

"

The system preferably has an autofocus assembly and a processor programmed to determine from the measurements the thickness and/or complex refractive index of a thin film on the sample.

"

(Piwonka-Coyle: abstract)

"

It would be useful for a variety of industrial applications to determine the thickness of a very small region of a very thin film (less than 30 angstroms in thickness) on a substrate from reflectance measurements (with sub-angstrom measurement repeatability) of the sample (e.g., where the sample is a semiconductor wafer and the very thin film is coated on a silicon substrate of the wafer). ... and then analyze the measured data to determine the refractive index and thickness of a layer of a sample...

"

(Piwonka-Coyle: column 2; lines 13-26)

"

By processing reference signals from reference channel detector 273 with signals from sample channel detector 173, the thickness (or refractive index) of a thin film on sample 3 can (under some conditions) be more accurately determined ... In the FIG. 12 system, processor 100 is programmed to normalize the reflectivity measured by sample beam 9 using the reference beam

measurements from detector 273, to compensate for such effects as lamp intensity fluctuations and air currents.

"

(Piwonka-Coyle: column 15; lines 9-22)

As a result, the Examiner believes that both references share a common goal of real-time optical monitoring of the wafers to achieve processing uniformity, and, when the references are combined as proposed by the Examiner, the Examiner believes that there is proper motivation for combining Giapis et al (USPat. 5,002,631) and Piwonka-Corle (USPat. 5,608,526). The examiner recognizes that obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either in the references themselves or in the knowledge generally available to one of ordinary skill in the art. See In re Fine, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988) and In re Jones, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir.,1992). In this case, teaching, suggestion, and motivation to combine the references is found in the references themselves (above).

Further, Applicant's position that "..Piwonka-Coyle does not teach or suggest mathematically operating on a sample signal to compensate for background radiation that is from the plasma". Because "lamp intensity fluctuations from a lamp used to generate the sample beam and air currents" are not "background radiation from a plasma".

In response, the Examiner believes that once the Examiner's combination is made:

"

It would have been obvious to one of ordinary skill in the art at the time the invention was made for Giapis to use Piwonka-Corle's signal analyzer to determine a thickness of a layer on a substrate from the normalized signal.

"

Piwonka-Corle's signal analyzer (100; column 15, lines 9-23; Figure 12) programmed to normalize radiation (column 15, line 15) specifically for "intensity fluctuation" compensations (column 15, line 18) would function as intended with Giapis' plasma radiation. The only difference, if there is a difference, between Piwonka-Corle's radiation processing and Giapis' "background radiation from a plasma" depends on what process gas composition Giapis uses in his plasma processing. As a result, the Examiner believes that Piwonka-Corle's signal analyzer programmed to normalize radiation specifically for "intensity fluctuation" compensations would operate as disclosed by Piwonka-Corle when Giapis uses gas compositions whose radiation is within Piwonka-Corle's signal analyzer radiation. Further, Piwonka-Corle demonstrates a wide range of radiation wavelengths that his lamp 10 emits and which is processed by his signal analyzer (100; column 15, lines 9-23; Figure 12) adapted to normalize the sample signal (9):

"

The illumination subsystem of FIG. 1 includes lamp 10 (preferably a xenon arc lamp including heatsink window 10A) which emits radiation beam 12 having a broad range of frequency components in the UV, visible, and near infrared wavelength bands...

" (column 6; lines 39-45).

Applicant maintains the above line of argument through page 16, second half of pages 17, 18.

Applicant further states, with respect to claim 30:

"

Giapis et al does not.teach one or more first fibers that transmit radiation from the radiation source to the reference detector substantially without transmitting the reference radiation to the chamber, as recited in the claim. Giapis et al. also does not teach or suggest an arrangement of the branches of the bifurcated fiber bundle with respect to the radiation source.

"

In response, Applicant is directed to the above new grounds of rejection as necesitated by Applicant's amendments.

Applicant disagrees with the Examiner's intended use opinion concerning the Examiner's citation of Piwonka-Corle. The Examiner upholds his position and further has conveyed all structural components of Piwonka-Corle that, as a whole, are shown to cooperate in the manner to perform Applicant's intended use of :

"

(a)before the gas energizer energizes the etchant gas, measuring the sample and reference signals,

(b)after the gas energizer energizes the etchant gas but before substantially etching has occurred, measuring the sample signal, and

(c)during etching, measuring the sample and reference signals, whereby a thickness of a layer being etched on the substrate or chamber wall

"

It is well established that apparatus claims must be structurally distinguished from the prior art (In re Danley, 120 USPQ 528, 531 (CCPA 1959). "Apparatus claims cover what a device is, not

what a device does ."(emphasis in original) Hewlett - Packard Co . v. Bausch & Lomb Inc ., 15 USPQ2d 1525, 1528 (Fed. Cir. 1990), MPEP – 2114). Further, a claim containing a "recitation with respect to the manner in which a claimed apparatus is intended to be employed does not differentiate the claimed apparatus from a prior art apparatus" if the prior art apparatus teaches all the structural limitations of the claim. Exparte Masham, 2 USPQ2d 1647 (Bd. Pat. App. & Inter. 1987). Because the Examiner has clearly conveyed all the structural components of Piwonka-Corle that are capable of performing the intended use, the Examiner believes that Piwonka-Corle inherently teaches the intended use.

The remainder of Applicant's arguments are addressed above in the body of the rejected claims or in responses to similar arguments.

Conclusion

9. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Examiner Rudy Zervigon whose telephone number is (571) 272.1442. The examiner can normally be reached on a Monday through Thursday schedule from 8am through 7pm. The official fax phone number for the 1763 art unit is (703) 872-9306. Any Inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Chemical and Materials Engineering art unit receptionist at (571) 272-1700. If the examiner can not be reached please contact the examiner's supervisor, Parviz Hassanzadeh, at (571) 272-1435.

5/2/5